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甘肃兰州盆地中中新世泉头沟动物群的仓鼠类[1)]

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摘要 记述了甘肃兰州永登泉头沟发现的4种仓鼠化石：*Plesiodipus leei* Young, 1927; *Megacricetodon sinensis* Qiu et al., 1981; *Ganocricetodon cheni* gen. et sp. nov.和 *Paracricetulus schaubi* Young, 1927。仓鼠类的组合和形态特征表明：泉头沟动物群与通古尔动物群的时代接近，同属中中新世通古尔期；指示的环境近似，同为相对干旱的温带丛林-草原环境；但它们的时代和生态环境略有差异，不排除泉头沟动物群时代略晚的可能。

关键词 甘肃，兰州盆地，中新世，咸水河组，仓鼠科

中图法分类号 Q915.873

甘肃兰州永登县下街(咸水河)泉头沟龙骨湾是西北地区发现较早的新近纪哺乳动物化石地点，发现的标本一直是我国北方地区中新世化石研究的比较对象。但作为西北地区一个重要的中中新世动物群，它仅包括 *Plesiodipus leei*、*Paracricetulus schaubi*、*Heterosminthus orientalis* 和 *Protalactaga grabaui* 4种小哺乳动物(Young, 1927; Schaub, 1930, 1934)。为了增加动物群的种类和加深对已知属、种的认识，1991年甘肃省博物馆、省文物考古研究所和中科院古脊椎动物与古人类研究所的科技人员在这一经典地点进行了取土筛洗，获代表7科的小哺乳动物化石一批，其中食虫类、跳鼠类、林跳鼠类和兔形类的描述已于此前发表(邱铸鼎，2000)，本文记述仓鼠类(详见本文的英文部分)，其余的睡鼠类和沙鼠类将另文发表。

泉头沟的仓鼠类化石比较丰富，归入 *Plesiodipus leei* Young, 1927; *Megacricetodon sinensis* Qiu et al., 1981; *Ganocricetodon cheni* gen. et sp. nov.和 *Paracricetulus schaubi* Young, 1927等4属4种，其中包括一新属、新种。*P. leei* 和 *P. schaubi* 标本可认为是属型种的补充材料，而 *M. sinensis* 的形态和构造特征与产自毗邻西宁盆地的正型标本完全一致。新属、新种及其特征如下。

甘古仓鼠属(新属)*Ganocricetodon* gen. nov.

陈氏甘古仓鼠(新种)*Ganocricetodon cheni* gen. et sp. nov.

特征 小个体仓鼠。臼齿低冠，冠面较横宽。上臼齿3根，中脊发育程度不一，原尖和

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前尖由单一或双脊连接；M1 前边尖分开，后边脊不发育，后外谷不显。m1 下前边尖简单、脊形，具下中脊及与原尖前臂连接的下后脊。

杨钟健(1927)根据采自甘肃咸水河(即本文的泉头沟地点)的两件标本创建了 *Paracricetulus schaubi*。绍伯(Schaub, 1930, 1934)对杨的研究作了订正，把其中的一件下颌骨归入林跳鼠科，命名为 *Heterosminthus orientalis*，另外一件标本仍保留杨的指定，但亦未赋予该属明确的特征，此后也再没有关于该属材料被发现的报道。

Paracricetulus schaubi Young, 1927 的模式标本系一件带有 M1–3的残破上颌骨，现作为"拉氏收藏品"保存于瑞典乌普萨拉大学博物馆。虽然正型标本的 M1 破碎，但仍可见其具有以下特征：M1 次尖向后内凸出，使牙齿的后内角不甚呈弧形；M2 的原尖不明显向前内向凸出，使牙齿的前内角近呈方角状；M2 具与原尖前臂和后臂对称连接的双原脊；有短的中脊；M1 和 M2 具 4 齿根。泉头沟新材料的 M1 和 M2 具有与 *P. schaubi* 正型标本一致的特征，而且这些特征的组合在本文记述的 3 种小型仓鼠中是独有的，牙齿的尺寸也很接近，无疑可以归入该种。根据前人的描述，以下可以作为该属、种的增订特征：小个体仓鼠。下颌骨体与齿列斜交达 30°左右；冠面视不见颏孔；侧视 m3 未完全被上升支遮掩。臼齿低冠，齿尖相对齿脊显著；M1 前边尖简单，内谷近横向，后外谷甚窄；M2 常具双原脊，并与原尖的前臂和后臂对称连接；M1 和 M2 的中脊发育程度变异大，前尖多见后刺，4 齿根。下颊齿无下中脊；m1 下前边尖简单，外谷宽阔，略前指。

在泉头沟动物群的仓鼠中，*Plesiodipus leei* 的尺寸大，属脊形齿，易与其他种类区别。在其余的 3 种小型仓鼠中，大体的差异如下：

Ganocricetodon cheni gen. et sp. nov.的个体相对较大，上、下臼齿相对短宽，主尖显著，使其易于区别其他 2 种；在 M1 齿尖和齿脊的排列方面，特别是前边尖有分开的趋向，多少与 *Megacricetodon sinensis* 相似，但却以齿冠相对横宽，没有后外谷而有所不同；其下颌骨的高度大，m1 下前边尖呈简单宽脊形，也不难与 *M. sinensis* 区分；以 M1 的前边尖分开浅，M1 和 M2 具 3 齿根，m1 下前边尖脊状而不同于 M1 前边尖简单，M1 和 M2 具 4 齿根，m1 具尖状下前边尖的 *Paracricetulus schaubi*。

结论 泉头沟发现的小哺乳动物化石除仓鼠科外，还有猬科、睡鼠科、林跳鼠科、跳鼠科、沙鼠科和鼠兔科，计 11 属 12 种，其中猬科、林跳鼠科、跳鼠科和鼠兔科的 4 属 5 种此前已作过报道(邱铸鼎，2000)。然而，该动物群名单似乎未必能客观地反映当时动物的组合面貌，因为华北新近纪常见的一些成员，如食虫目中的鼹科和鼩鼱科、啮齿目中的松鼠科均未在动物群中出现，中中新世华北和西北广布的鼠兔科只有一个牙齿为代表。这些如果不是由于它在生态上的独特性，就可能是埋藏或采集上的原因。尽管如此，泉头沟动物群的组成显示了它与我国通古尔小哺乳动物群最为接近。

泉头沟动物群与通古尔动物群有颇多相同的小哺乳动物属种，说明两者的时代接近和所指示的生存环境近似。但它们在仓鼠科的组成上有明显的不同，即泉头沟动物群含有通古尔动物群所没有的 *Ganocricetodon cheni* 和 *Paracricetulus schaubi*，而后一动物群中较为常见的 *Democricetodon* 属却未见在前一动物群中出现，这又可能表明两动物群在时代和生态环境方面存在一些差异。至于时代，从两动物群的 *Heterosminthus orientalis* 和 *Megacricetodon sinensis* 的比较看来，泉头沟的 *Heterosminthus* 上臼齿中脊的平均长度较短，下臼齿下外中脊相对较长，*Megacricetodon* 上、下臼齿的中脊平均长度较短，这些性

状在两属的演化中一般被认为是衍生性状(邱铸鼎,1996)。另外,泉头沟 *Plesiodipus leei* 牙齿的平均尺寸较大,也可能属于进步的特征。因此,泉头沟动物群的时代虽可认定与通古尔动物群接近(后者被确定为中中新世,与欧洲 MN8 的相当,见李传夔等,1984; 邱占祥等,1990; 邱铸鼎,1996),但并不排除前者略晚。

根据对该动物群食虫类、林跳鼠类、跳鼠类和兔形类的研究,本文作者认为泉头沟动物群反映了一个温带干旱、半干旱丛林-草原型的自然环境,与通古尔指示的甚为相似。但由于两动物群中仓鼠科的组成不同,也许指示了两个不同的生态小区,也就是说,中中新世时东部和西部地区的生境已有所分异。

CRICETID RODENTS FROM THE MIDDLE MIOCENE QUANTOUGOU FAUNA OF LANZHOU, GANSU

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Abstract Four species of cricetid rodents are recognized and described from the upper Xianshuihe Formation of Tunggur age (middle Miocene) at Quantougou, Gansu. Among the cricetids, *Ganocricetodon cheni* is new. A comparison of the Quantougou assemblage with that of Tunggur reveals some striking similarities in composition and obvious differences among cricetids, that are temporal, ecological, or both.

Key words Lanzhou Basin of Gansu, Xianshuihe Formation, Middle Miocene, Cricetidae

1 Introduction

A new collection of small mammals was made in 1991 by a team made up of the Provincial Museum of Gansu, the Institute of Cultural Relics and Archaeology of Gansu, and the IVPP at Quantougou near Xianshuihe, a classic locality in Gansu Province. Seven families of small mammals were screen-washed from about 150 kg of sediments of the upper Xianshuihe Formation of Tunggur age (middle Miocene), of which eight taxa were added to the micromammalian fauna previously described as the Hsienshuho assemblage by C. C. Young in 1927 and S. Schaub in 1930 and 1934. As for the geological background of this locality and description of Erinaceidae, Zapodidae, Dipodidae and Ochotonidae of the fauna, the reader is referred to the previous presentation (Qiu et al. 1997; Qiu, 2000). This paper deals with the Cricetidae. The Gliridae and Gerbillidae will be described next.

2 Systematics

Cricetidae Rochebrune, 1883

***Plesiodipus* Young, 1927**

***Plesiodipus leei* Young, 1927**

(pl.I, 1~6)

Material Four maxillary fragments including 1 M1, 2 M2, 3 M3; 2 mandible fragments with m2-3; 35 isolated teeth (2 M1, 1 M2, 7 M3, 13 m1, 5 m2, 7 m3); V 12590.1~41.

Measurements (Table 1)

Table 1 Measurements of the teeth of *Plesiodipus leei* (mm)

		Length		Width	
Tooth	N	Mean	Range	Mean	Range
M1	1	2.93	2.75～3.10	2.05	2.00～2.10
M2	3	2.63	2.40～2.75	2.02	2.00～2.05
M3	10	1.80	1.60～2.00	1.63	1.50～1.80
m1	9	2.60	2.45～2.70	1.73	1.55～1.90
m2	4	2.45	2.30～2.60	2.00	1.95～2.05
m3	9	2.28	2.10～2.40	1.74	1.65～1.90

Description A maxillary fragment shows the posterior margin of the anterior zygomatic arch arising anterior to M1. Ascending ramus of dentary arises opposite the posterior border of m2. Masseteric crest pronounced beneath m1 and m2. The horizontal ramus below m2 measures 4.4 mm and 4.8 mm, respectively.

The molars are bunolophodont with prominent cusps and developed crests, four roots in upper molars except the three-rooted M3, and two roots in lower molars.

M1: Anterocone robust, single-cusped, compressed anteroposteriorly, and connected with anterior arm of protocone by a striking anterolophule; protocone larger, located slightly anterior to the paracone with its posterior arm connected to the "middle oblique crest", which consists of the paracone, entoloph and hypocone; hypocone strong, joins metacone by a short metaloph; metacone similar to paracone in size and morphology. M2 wider anteriorly than posteriorly; protocone located distinctly anterior to paracone; weak anterocone close to protocone and joins the anteroloph; antero-entosinus absent. M3 triangular with similar protocone and paracone in shape to those of M2; hypocone rather reduced and the metacone serves as a ridge connecting hypocone and paracone.

m1: Anteroconid prominent, single-cusped with a labial anterolophid in 12 of 13 specimens; two anterolophulids, with the lingual one connecting to the anterior metalophid and the labial one joining the anterior arm of protoconid; with wear a quadrilateral grinding surface appears on protoconid and hypoconid; hypoconid has a distinct anterolabial crest; metaconid and entoconid similar in shape; posterior metalophid present in 6 teeth; hypolophid short and connected to mesoconid; longitudinal crest more robust anteriorly than posteriorly, joining mesoconid, protoconid and entoconid to form a strong "middle oblique crest"; well developed posterolophid bears a pronounced hypoconulid. m2: anteroconid fused with metaconid to form a strong transversely-directed anterolophid; protoconid prominent, with its anterior arm extending to the anterolophid labial to the midline; hypoconid and posterolophid merged as a short crest parallel to and connected with the "middle oblique crest". m3 similar to m2 in dental pattern, but smaller in size and more reduced posteriorly.

Remarks The specimens described are additional materials of *Plesiodipus leei* Young, 1927 from the type locality. *P. leei* is also known from Lierbao, Qinghai (Qiu et al., 1981) and Tunggur, Nei Mongol (Qiu, 1996). The specimens from Lierbao are identified with the material of Quantougou, while the teeth from Tunggur are slightly smaller in size than those of Quantougou on an average. *P. leei* is more primitive than *P. progressus* from Moergen V of Tunggur based on lower crown height, bunodont cheek teeth, less undulated enamel crown base and less extend external sinusae of M1 (Qiu, 1996).

***Megacricetodon* Fahlbusch, 1964**

***Megacricetodon sinensis* Qiu et al., 1981**

(pl.I, 7～12)

Material Twelve maxillary fragments including 10 M1, 7 M2, 2 M3; 17 mandible

fragments including 10 m1, 14 m2, 11 m3; 42 isolated teeth (5 M1, 8 M2, 4 M3, 15 m1, 7 m2, 3 m3); V 12591.1～71.

Measurements (Table 2)

Table 2 Measurements of the teeth of *Megacricetodon sinensis* (mm)

		Length		Width	
Tooth	N	Mean	Range	Mean	Range
M1	12	1.48	1.35～1.60	1.01	0.90～1.10
M2	13	1.08	1.00～1.15	0.92	0.85～1.00
M3	5	0.82	0.80～0.85	0.82	0.80～0.85
m1	19	1.35	1.25～1.45	0.86	0.80～0.95
m2	20	1.16	0.95～1.25	0.96	0.85～1.10
m3	13	0.88	0.80～0.95	0.83	0.75～0.85

Description Masseteric fossa wide and shallow. Masseteric crest terminates anteriorly with a moderate nub beneath m1. Horizontal ramus below m2 measures about 2.3 mm in 5 specimens.

Molars are brachydont with three roots in upper molars and two in lower ones.

M1: Anterocone marked, unequally bilobed with the lobes connected posteriorly in almost all specimens; weak ledge or anterior stylar shelf present in 8 specimens; anterolophule straight, joining anterior arm of protocone with anterocone near the midline in 9 specimens and with lingual side of midline in 7; protoloph short, posteriorly-directed to join the longitudinal crest; longitudinal crest curved and thicker posteriorly; mesoloph low, weak, long in 5 of 15 specimens, short in 7, nearly absent in 3; metaloph short, posteriorly-directed, either connected to posteroloph or posterior arm of hypocone; posteroloph well developed, closing a very narrow postero-ectosinus; sinus transverse; lingual cingulum usually present. M2: Labial branch of anteroloph striking, but lingual branch relatively weak, nearly absent in 3 cases; protoloph anteriorly-directed, usually connected to the anterior arm of protocone; a posterior protoloph absent; longitudinal crest semicircular, thicker posteriorly; mesoloph low, weak, of 15 teeth extending to the labial margin in 2, long in 3, short in 9 and absent in one; metaloph usually anteriorly-directed or transverse to join hypocone or its anterior arm, posteriorly-directed to join the posterior arm of hypocone in one case; posteroloph developed, closing the postero-ectosinus; sinus transverse, with weak cingulum usually on the edge of the sinus. M3: Occlusal outline triangular; lingual branch of anteroloph weak or completely absent; protoloph directed anteriorly, joining the junction of anterior arm of protocone and anteroloph; longitudinal crest short, connecting protocone with the small hypocone; metacone rather reduced, hypocone fused into posteroloph; weak mesoloph present in two specimens.

m1: Anteroconid high, narrow, single-cusped; lingual branch of anterolophid short, extending to the base of metaconid in a few specimens, bearing a tiny cusp in 3 cases; labial branch of anterolophid joins protoconid, bearing a tiny cusp in 2 teeth; anterolophulid straight, weak, absent in one case, usually joining anteroconid on labial side of midline; metalophid usually directed anteriorly to join anterolophulid, slightly transverse to connect anterior arm of protocone in two teeth; longitudinal crest semicircular; short and weak mesolophid present in 10 of 19 specimens; hypolophid short, anteriorly-directed or nearly transverse to join longitudinal crest, absent in one tooth; posterolophid well developed, closing the posteroentosinusid; sinusid anteriorly-directed, usually with narrow cingulum on the edge of the sinusid. m2: Labial branch of anterolophid pronounced, lingual branch weakly developed; metalophid short, anteriorly-directed, joining the midline of anterolophid with anterior arm of protoconid; longitudinal crest complete, semicircular, thick anteriorly; mesolophid long in 4 and short in 16 specimens; hypolophid short,

slightly anteriorly-directed to join the longitudinal crest; posterolophid strong, bearing a hypoconulid in some specimens. m3: Subtriangular; metalophid very short, anteriorly-directed, connected either to anterolophid or to the anterior arm of protoconid; longitudinal crest curved and thick anteriorly; entoconid reduced and melded with hypolophid and posterolophid to form a posterolingual crest and enclose the postero-entosinusid.

Remarks Dental characters of the hamster described fit the diagnosis of *Megacricetodon* widely known in the Old World. These characters are: low crowned, with bilobed anterocone on M1; M1 and M2 with mesoloph, postero-ectosinus and connection between protocone and paracone; m1 being the longest lower molar, with single-cusped anteroconid; m1 and m2 usually having mesolophid.

Materials from the type locality of *Megacricetodon sinensis* are limited, but they fall, together with a M1 described as *M.* cf. *sinensis* from Qijiagoukou, Minhe (Qiu et al. 1981), within the range exhibited by the specimens of Quantougou both as to size and dental morphology. *M. sinensis* also occurs at Tunggur, Nei Mongol, but specimens differ from those of Quantougou only in having longer mesoloph(id)s on average.

Wessels (1996) critiqued the occurrence of *Megacricetodon* in Pakistan and reallocated all material from the Indian subcontinent previously assigned to *Megacricetodon* to the myocricetodontine genus *Sindemys*. It seems to me, however, that the differential diagnosis emphasized by Wessels, i.e. frequent occurrence of an entostyle and/or a lingual cingulum in M1 and M2, large variation in shape of longitudinal crest, weak connection between protocone and longitudinal crest, more developed posterior part of longitudinal crest of m1, without a bean-shaped anteroconid on m1, is at the specific, and by no means generic level. Compared with European *Megacricetodon* and African *Myocricetodon*, the Siwalik hamsters are more similar to the former than to the latter in morphology.

Ganocricetodon gen.nov.

Etymology Gan, a prefix, the Chinese abridged version for Gansu Province, China.

Diagnosis Small cricetid with low and relatively wide crown. Upper molars with three roots, variably developed mesolophs, single or double connections between protocone and paracone; M1 with weakly bilobed anterocone, poorly developed posteroloph and posteroectosinus; m1 with simple, lophate and single-cusped anteroconid, mesolophid present, and a metalophid connecting to anterior arm of protoconid.

Differential diagnosis Characters of the new genus confine its comparisons to the small bunolophodont cricetids of the middle Miocene of the Old World. *Ganocricetodon* differs from *Megacricetodon* in having a deeper horizontal ramus, in molars being relatively short and wide without a clear postero-ectosinus in M1, but with a simple and lophate anteroconid in m1. It is distinct from *Democricetodon* in having a bilobed anterocone and an undeveloped postero-ectosinus in M1; from *Spanocricetodon* in having a bilobed anterocone, undeveloped postero-ectosinus in M1, and a mesolophid in m1 (Li, 1977; de Bruijn, 1981); from *Paracricetulus* in wider occlusal surface of molars and three-rooted upper molars, in having bilobed anterocone and undeveloped postero-ectosinus in M1, the presence of lophate anteroconid and mesolophid in m1; from *Shamalina* in having relatively heavily built main cusps, without postero-ectosinus in M1, with double protolophs in M2 and a mesolophid in m1.

Ganocricetodon cheni gen. et sp. nov.

(pl.I, 13~18)

Etymology Named in honor of the capable technician Chen Shanqin who made great

contributions in collecting Neogene small mammals.

Holotype Left maxillary fragment with M1; V 12592.

Paratypes Four maxillary fragments including 3 M1, 1 M2; 2 mandible fragments with m2～3 and m2, respectively; 7 isolated teeth (1 M1, 1 M3, 2 m1, 1 m2, 2 m3); V 12593.1～13.

Diagnosis As for the genus.

Measurements (Length × width) M1: 1.70～1.80 × 1.20～1.30 mm (4); M2: 1.25 × 1.15 mm; M3: 0.85 × 0.95 mm; m1: 1.45～1.50 × 0.95～1.00 mm (2); m2: 1.20～1.25 × 1.05～1.10 mm (3); m3: 0.90～0.95 × 0.85 mm (2).

Description Masseteric fossa wide and deep. Masseteric crest developed and terminates with a marked nub beneath m1. Horizontal ramus below m2 measures 3.3 mm.

M1: Occlusal outline short and wide; anterocone relatively narrow, clearly divided by a furrow on the anterior face in the type specimen, weakly divided in others; ledge or anterior stylar shelf present in 3 of 5 specimens; anterolophule complete, joining anterocone with the anterior arm of protocone; protoloph short, transverse or slightly posteriorly-directed to join the posterior arm of protocone; longitudinal crest short and straight; mesoloph short and weak, but reaching the margin and terminating with a cuspule in one specimen; metaloph very short, posteriorly-directed to join the posterior arm of hypocone; postero-ectosinus absent; sinus transverse, with developed lingual cingulum; three-rooted. M2: Narrower posteriorly than anteriorly; anteroloph pronounced; protoloph double, connected symmetrically with the anterior arm of protocone and longitudinal crest; longitudinal crest curved or angular; mesoloph long, nearly extending to the labial margin; metaloph anteriorly-directed, joining the anterior arm of hypocone; posteroloph developed, closing the postero-ectosinus; sinus narrow, posteriorly-directed, with lingual cingulum; three-rooted. M3: Occlusal outline triangular with normally developed protocone, reduced metacone and lophate hypocone; anteroloph complete; protoloph directed anteriorly, joining anteroloph with the anterior arm of protocone; longitudinal crest discontinuous; mesoloph extends to labial edge of the tooth; three-rooted.

m1: anteroconid single-cusped, relatively narrow; the lingual branch of anterolophid shorter than labial one, and they extend to the base of metaconid and protoconid respectively; anterolophulid low and weak; metalophid directed anteriorly to join anterolophulid or anteroconid, a posterior metalophid connected with the protoconid present in one specimen; longitudinal crest curved; mesolophid reaches lingual edge of the tooth in one specimen, the other lacks a mesolophid but has a low connection between the metaconid and entoconid; hypolophid anteriorly-directed to join longitudinal crest; posterolophid well developed, extending to base of entoconid; sinusid anteriorly-directed; two-rooted. m2: anterolophid moderately developed with the labial branch joining the base of protoconid, lingual branch very narrow; metalophid short, anteriorly-directed, joining the anterolophid; longitudinal crest complete, semicircular; mesolophid unclear; hypolophid short, transverse or slightly anteriorly-directed to join longitudinal crest; posterolophid strong, extending to the lingual margin; sinusid anteriorly-directed. m3: anterolophid weakly developed; metalophid very short, metaconid close to anterolophid; longitudinal crest angular; entoconid merged into a connection of metaconid and hypoconid, enclosing the postero-entosinusid with the hypolophid and posterolophid; sinusid anteriorly-directed.

Paracricetulus Young, 1927

Diagnosis (improved) Small cricetid. Row of cheek teeth intersecting mandibular body at about 30°; mental foramen not visible in occlusal view; m3 unhidden by the ascending ramus in external view. Brachydont cheek teeth with more striking cusps than

lophs; M1 with simple anterocone, nearly transverse sinus and narrow postero–ectosinus; M2 with double protolophs connected symmetrically to protocone; M1, M2 with variably developed mesoloph, usually paracone–spur and four roots; m1 with single–cusped anteroconid, transverse and slightly anteriorly–directed sinusid; mesolophid absent in lower cheek teeth.

Remarks *Paracricetulus* was first named by C. C. Young (1927) based on two specimens from Hsienshuiho (Xianshuihe, the same locality as Quantougou). The type specimen of *Paracricetulus schaubi* is an upper dentary with M1–3, kept in the Paleontology Museum of Uppsala University "Lagrelius Collection". Although the M1 is damaged, the type specimen shows clearly the following characters: the hypocone of M1 is protruding posterolingually; the protocone of M2 is moderately prominent anterolingually; M2 has double protolophs joining symmetrically the protocone, and a short mesoloph; four roots are present in M1 and M2. The following described materials are referred to the type species because of the identity of M1 and M2 with the type specimen in size and morphology, and the uniqueness of the combined diagnostic characters in the cricetid collection from this site.

Differential diagnosis *Paracricetulus* can be easily distinguished from almost all the small–sized cricetids from the middle Miocene of the Old World by its deep horizontal ramus and four–rooted M1 and M2, and absence of mesolophid in lower molars. It differs from *Megacricetodon* in its simple anterocone in M1, presence of double protolophs in M2, frequent presence of paracone–spur in M1 and M2, and double metalophid in m1; from *Democricetodon* in having longer and narrower M1 and m1 with smaller anterocone (id), and protoloph of M1 and metalophid of m1 always posteriorly–directed to join the posterior arm of protocone and protoconid respectively; from *Spanocricetodon* in having larger intersecting angle of the dentary row and mandibular body, relatively more striking cusp(id)s than loph(id)s, narrower anterocone(id), wider and oblique sinusid. By its simple anterocone in M1 and in lower molars, *Paracricetulus* can be easily distinguished from *Shamalina*.

***Paracricetulus schaubi* Young, 1927**

(pl. I, 19～24)

Material Thirty–six maxillary fragments including 26 M1, 14 M2, 4 M3; 18 mandible fragments including 11 m1, 11 m2, 4 m3; 109 isolated teeth (20 M1, 21 M2, 2 M3, 25 m1, 29 m2, 12 m3); V 12594.1～163.

Measurements (Table 3)

Table 3 Measurements of the teeth of *Paracricetulus schaubi* (mm)

		Length		Width	
Tooth	N	Mean	Range	Mean	Range
M1	37	1.54	1.40～1.70	1.03	0.95～1.10
M2	32	1.19	1.10～1.30	1.04	1.00～1.10
M3	5	0.73	0.70～0.80	0.81	0.75～0.85
m1	33	1.37	1.25～1.45	0.92	0.85～1.00
m2	38	1.21	1.15～1.30	1.04	1.00～1.15
m3	17	0.99	0.95～1.00	0.84	0.75～0.90

Description The dental row intersects the mandibular body at about 30°; the mental foramen low and not sighted in occlusal view; m3 unhidden by the ascending ramus in external view; masseteric fossa wide and shallow; masseteric crest clear and terminates with a nub beneath m1; diastema 3.7～4.2 mm and horizontal ramus below m2 measure 5.4～6.0 mm.

Molars brachydont with more pronounced cusp(id)s relative to loph(id)s; anterior arms of protocone and hypocone more developed than their posterior arms, anterior arms of protoconid and hypoconid less developed than their posterior arms; M1 and M2 four–rooted, M3 three–rooted and lower molars with two roots.

M1: Anterocone unbilobed with long, descending lingual branch of anteroloph and a short labial one that ends in a weakly developed cusp in 8 specimens; anterolophule short, joining anterior arm of protocone with lingual side of anterocone; protoloph short, transverse or slightly posteriorly–directed to join the longitudinal crest, a low anterior protoloph present in 8 teeth; weak paracone–spur present in half the specimens; longitudinal crest short, straight or slightly curved; mesoloph present in all specimens, reachs the margin in 5, long in 8, short in 28 (in 25 it is close to or connected to the paracone–spur); metaloph short, posteriorly–directed, either connected to posteroloph or the posterior arm of hypocone; posteroloph and postero–ectosinus narrow; sinus transverse; weak lingual cingulum present in some specimens. M2: Double protolophs present in all but 5 specimens, of which 4 own only posterior protoloph and one lacks any protoloph; weak paracone–spur present in 15 specimens; longitudinal crest short, straight or semicircular; mesoloph present in all specimens, reaching the margin in 7, long in 10, short in 15, of which in 8 the mesolophid is connected to the paracone–spur; metaloph either anteriorly–directed to join the longitudinal crest or posteriorly–directed to join posteroloph; posteroloph developed, close to the narrow postero–ectosinus; sinus narrow, usually transverse; usually with weak lingual cingulum. M3: Protoloph directed anteriorly, joining anteroloph; longitudinal crest poorly developed, discontinuous in two specimens; weak mesoloph present; hypocone crest–like; with a small postero–ectosinus.

m1: Anteroconid small, single–cusped; anterolophid weakly developed, the labial branch distinctly longer than the lingual one, which is missing in about half the specimens; anterolophulid low and weak, joining anteroconid with metaconid in most and with protoconid in a few, lacking in 5 teeth; variably developed double metalophids present in almost all specimens, but 3 teeth have only a posterior metalophid; longitudinal crest long but low, varying from straight to curved; mesolophid absent; hypolophid very short, anteriorly–directed or nearly transverse, joining longitudinal crest; posterolophid well developed, bearing a hypoconulid in a few specimens; sinusid wide and anteriorly–directed, sometimes with narrow labial cingulum, cuspate cingulum in 3 teeth. m2: Labial branch of anterolophid pronounced, while lingual branch weakly developed; the single metalophid short, joining the anterior arm of protoconid to anterolophid; longitudinal crest complete, thick, varying from straight to semicircular; mesolophid absent; hypolophid short and thick, usually joining the longitudinal crest; posterolophid strong, bearing a hypoconulid in some specimens; sinusid anteriorly–directed in all but one specimen, usually with a weak labial cingulum. m3: Metalophid very short, anteriorly–directed; longitudinal crest curved, discontinuous in one tooth; hypolophid present, connecting entoconid with longitudinal crest; entoconid reduced and melded with hypolophid and posterolophid to close the postero–entosinusid.

3 Conclusions

The Quantougou cricetid fauna is comprised of 4 genera and 4 species, of which one genus and 1 species are new. Cricetid rodents are an important component of the Quantougou fauna, because they were quite diverse. Nevertheless, they are endemic to the northeastern Asia except *Megacricetodon*. In addition to Cricetidae mentioned, Erinaceidae, Gliridae, Zapodidae, Dipodidae, Gerbillidae and Ochotonidae, including altogether 11 genera and 12 species, are now recognized from the Quantougou fauna, of which

lophs; M1 with simple anterocone, nearly transverse sinus and narrow postero-ectosinus; M2 with double protolophs connected symmetrically to protocone; M1, M2 with variably developed mesoloph, usually paracone-spur and four roots; m1 with single-cusped anteroconid, transverse and slightly anteriorly-directed sinusid; mesolophid absent in lower cheek teeth.

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Paracricetulus schaubi Young, 1927

(pl. I, 19~24)

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contributions in collecting Neogene small mammals.

Holotype Left maxillary fragment with M1; V 12592.

Paratypes Four maxillary fragments including 3 M1, 1 M2; 2 mandible fragments with m2～3 and m2, respectively; 7 isolated teeth (1 M1, 1 M3, 2 m1, 1 m2, 2 m3); V 12593.1～13.

Diagnosis As for the genus.

Measurements (Length × width) M1: 1.70～1.80 × 1.20～1.30 mm (4); M2: 1.25 × 1.15 mm; M3: 0.85 × 0.95 mm; m1: 1.45～1.50 × 0.95～1.00 mm (2); m2: 1.20～1.25 × 1.05～1.10 mm (3); m3: 0.90～0.95 × 0.85 mm (2).

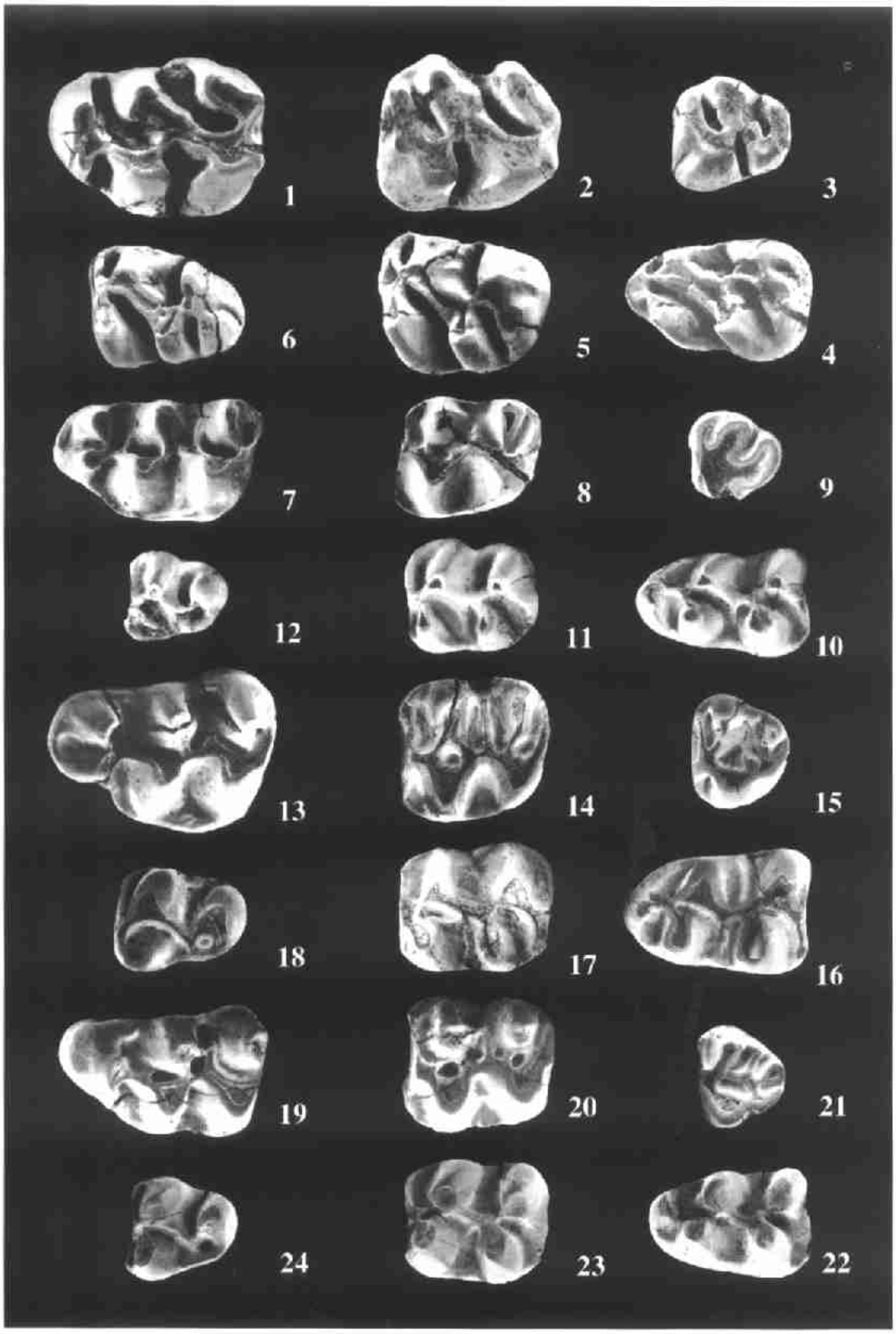
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